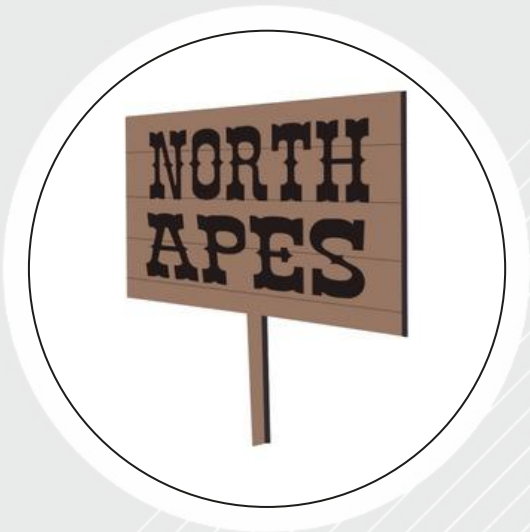
SPYWOLF

Security Audit Report

(TESTNET)



Completed on

February 02, 2023

OVERVIEW

This audit has been prepared for **North Apes** to review the main aspects of the project to help investors make make an informative decision during their research process.

You will find a a summarized review of the following key points:

- ✔ Contract's source code
- ✔ Owners' wallets
- ✔ Tokenomics
- ✔ Team transparency and goals
- ✔ Website's age, code, security and UX
- ✔ Whitepaper and roadmap
- ✔ Social media & online presence

The results of this audit are purely based on the team's evaluation and does not guarantee nor reflect the projects outcome and goal

- SPYWOLF Team -

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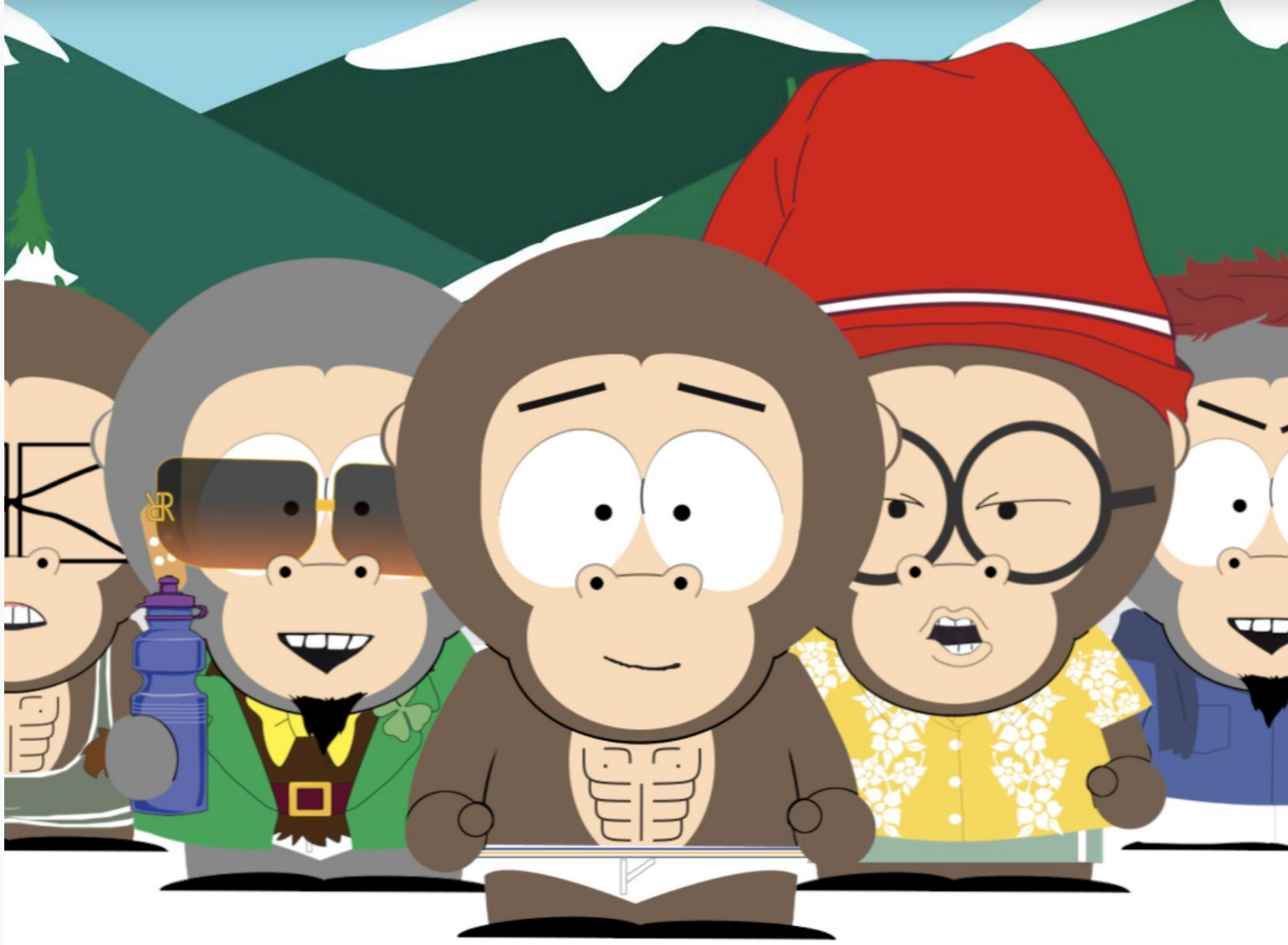
North Apes



PROJECT DESCRIPTION

According to their whitepaper:

North Apes is an interactive NFT collection of 5,555 unique apes and a deflationary token on the Ethereum blockchain. Both the NFT and the token come with well known but also new features and opportunities to take profits on an initial investment. Most importantly, however, does the project aim to incentivize activity along its community.

Release Date: Minting starts in February 3rd, 2023

Category: NFT

CONTRACT INFO

Token Name
North COin

Symbol
NORTH

Contract Address
0xea8085e171f740DCA62069D1E29AE01B08F99bcF

Network
Binance Smart Chain
TESTNET

Language
Solidity

Deployment Date
Feb 01, 2023

Verified?
Yes

Total Supply
1,000,000,000

Status
Not launched

TAXES

Buy Tax
Up to 5%

Sell Tax
Up to 20%

Our Contract Review Process

The contract review process pays special attention to the following:

- Testing the smart contracts against both common and uncommon vulnerabilities
- Assessing the codebase to ensure compliance with current best practices and industry standards.
- Ensuring contract logic meets the specifications and intentions of the client.
- Cross referencing contract structure and implementation against similar smart contracts produced by industry leaders.
- Thorough line-by-line manual review of the entire codebase by industry experts.

Blockchain security tools used:

- OpenZeppelin
- Mythril
- Solidity Compiler
- Hardhat

CURRENT STATS

(As of February 02, 2023)

Liquidity

0.1 WBNB

Burn

No burnt tokens

Status:

Not Launched!

MaxTxAmount

No limit

DEX

PancakeSwap

LP Address(es)

Liquidity not added yet

TOKEN TRANSFERS STATS

Transfer Count	TESTNET
Uniq Senders	TESTNET
Uniq Receivers	TESTNET
Total Amount	TESTNET
Median Transfer Amount	TESTNET
Average Transfer Amount	TESTNET
First transfer date	TESTNET
Last transfer date	TESTNET
Days token transferred	TESTNET

SMART CONTRACT STATS

Calls Count	TESTNET
External calls	TESTNET
Internal calls	TESTNET
Transactions count	TESTNET
Uniq Callers	TESTNET
Days contract called	TESTNET
Last transaction time	TESTNET
Created	TESTNET
Create TX	TESTNET
Creator	TESTNET

FEATURED WALLETS

Owner address	0x069c853983de5b78f103710d88681a7ca161f5d0
LP address	**Liquidity not added yet**

TOP 3 UNLOCKED WALLETS

1 N/A TESTNET

2 N/A TESTNET

3 N/A TESTNET

VULNERABILITY CHECK

Design Logic	Passed
Compiler warnings.	Passed
Private user data leaks	Passed
Timestamp dependence	Passed
Integer overflow and underflow	Passed
Race conditions and reentrancy. Cross-function race conditions	Passed
Possible delays in data delivery	Passed
Oracle calls	Passed
Front running	Passed
DoS with Revert	Passed
DoS with block gas limit	Passed
Methods execution permissions	Passed
Economy model	Passed
Impact of the exchange rate on the logic	Passed
Malicious Event log	Passed
Scoping and declarations	Passed
Uninitialized storage pointers	Passed
Arithmetic accuracy	Passed
Cross-function race conditions	Passed
Safe Zeppelin module	Passed
Fallback function security	Passed

THREAT LEVELS

When performing smart contract audits, our specialists look for known vulnerabilities as well as logical and access control issues within the code. The exploitation of these issues by malicious actors may cause serious financial damage to projects that failed to get an audit in time. We categorize these vulnerabilities by the following levels:

High Risk

Issues on this level are critical to the smart contract's performance/functionality and should be fixed before moving to a live environment.

Medium Risk

Issues on this level are critical to the smart contract's performance/functionality and should be fixed before moving to a live environment.

Low Risk

Issues on this level are minor details and warning that can remain unfixed.

Informational

Information level is to offer suggestions for improvement of efficacy or security for features with a risk free factor.

FOUND THREATS

⚠ High Risk

If fraudulent user sends certain (small) amount of tokens to staking user, it becomes impossible for the staking user to unstake their tokens. balanceOf(account) become greater than super.balanceOf(account) and the transaction reverts due to negative subtraction result.

```
function balanceOf(address account) public view override returns (uint256) {
    if (account == address(this)) {
      return super.balanceOf(account) - _reflections;
    }

    uint256 stakeShare = _stakeShares[account];
    return stakeShare == 0 ? super.balanceOf(account) : staked * stakeShare / _totalStakeShare;
  }


  function unstake() external {
    address sender = _msgSender();
    uint256 unlockTimestamp = stakeUnlockTimestamp[sender];
    require(unlockTimestamp != 0, "NorthCoin::unstake: not staking");
    require(block.timestamp >= unlockTimestamp,
     "NorthCoin::unstake: unlock timestamp not reached");
    stakeUnlockTimestamp[sender] = 0;
    _unstake(sender);
    emit Unstake(sender);
  }

  function _unstake(address account) private {
    uint256 reflection = balanceOf(account) - super.balanceOf(account);

    if (reflection != 0) {
      _reflections -= reflection;
      _transferAndUpdate(address(this), account, reflection);
    }

    staked -= super.balanceOf(account);
    _totalStakeShare -= _stakeShares[account];
    _stakeShares[account] = 0;
  }
```

Sample reference:

```
function checkBalances(address account)
public view returns (uint256 balance,
uint256 superBalance) {
balance = balanceOf(account);
superBalance = super.balanceOf(account);
return (balance, superBalance);
}
```

checkBala... c75641046926d1096605b4

0: uint256: balance 114205545454545454545453

1: uint256: superBalance 1142055454545454545454545454

- Recommendation:
  - Consider formula that do not cause negative subtractions results and/or overflows.

FOUND THREATS

⚠ Medium Risk

Owner can withdraw LP tokens from the contract 2 minutes after initiating the unlockLP function.

```
uint256 private constant TIMELOCK = 2 minutes;

 function unlockLP() external onlyOwner {
   _lpUnlockTimestamp = block.timestamp + TIMELOCK;
   emit UnlockLP(_lpUnlockTimestamp);
 }

 function withdrawLP() external onlyOwner {
   require(_lpUnlockTimestamp != 0 && block.timestamp >= _lpUnlockTimestamp,
   "NorthCoin::withdrawLP: LP is locked");
   IUniswapV2Pair pair = IUniswapV2Pair(_pair);
   uint256 lp = pair.balanceOf(address(this));

   if (lp != 0) {
     pair.transfer(_pair, lp);
     pair.burn(address(this));
   }

   IERC20 weth = IERC20(_weth);
   weth.safeTransfer(_treasury, weth.balanceOf(address(this)));
 }
}
```

FOUND THREATS

Informational

Owner can set the NFT address once.
If non contract address is set as NFT or contract that do not have the correct balanceOf() function, trading will fail.

```
address private immutable _nft;
constructor(address treasury, address nft) ERC20("North Coin", "NORTH") {
    _treasury = treasury;
    _nft = nft;
    _router = INorthTreasury(treasury).router();
    IUniswapV2Router02 router = IUniswapV2Router02(_router);
    _weth = router.WETH();
    _pair = IUniswapV2Factory(router.factory()).createPair(address(this), _weth);
    _mint(treasury, 10 ** decimals() * MAX_SUPPLY);
    _updateHolders(treasury);
}

function _transfer(address sender, address recipient, uint256 amount) internal override {
.....................
 uint256 balance = IERC721(_nft).balanceOf(recipient);
    if (balance == 0) {
      fee = amount / 20; // 5%
    } else if (balance == 1) {
     fee = amount / 25; // 4%
    } else if (balance == 2) {
     fee = amount * 3 / 100; // 3%
    } else if (balance == 3) {
     fee = amount / 50; // 2%
    } else if (balance == 4) {
     fee = amount / 100; // 1%
    }
.....................
}
```

FOUND THREATS

Informational

This token uses dynamic sell fees up to 20%.
Buy fees are from 5% to 1% considering the amount of NFTs that user hold (from 0 to 4 NFTS). If user holds above 4 nfts buy fees become 0%.
Combined buy+sell=25%.

```
function _transfer(address sender, address recipient, uint256 amount) internal override {
.........................
    uint256 fee;
    buying = true;
  uint256 balance = IERC721(_nft).balanceOf(recipient);

  if (balance == 0) {
    fee = amount / 20; // 5%
  } else if (balance == 1) {
    fee = amount / 25; // 4%
  } else if (balance == 2) {
    fee = amount * 3 / 100; // 3%
  } else if (balance == 3) {
    fee = amount / 50; // 2%
  } else if (balance == 4) {
    fee = amount / 100; // 1%
  }
}
} else if (recipient == _pair) { // selling
uint256 newVariableSellFee = Math.min(variableSellFee + FEE_DENOMINATOR * amount / liquidity, FEE_DENOMINATOR / 5);
// increase variable sell fee based on amount vs liquidity to max. 20%

if (newVariableSellFee != variableSellFee) {
  emit UpdateVariableSellFee(variableSellFee, newVariableSellFee);
  variableSellFee = newVariableSellFee;
}

fee = amount * variableSellFee / FEE_DENOMINATOR;
}
.........................
}
```

Informational

This contract uses intermediary 'treasury' contract that sets the token's router and receives the total minted token supply and NFT contract that is used in dynamic buy taxes.
The intermediary contract and the NFT contract are not in the scope of the current audit.

```
address public immutable _treasury;
address public immutable _nft;
address public immutable _router;
address public immutable _weth;
address public immutable _pair;

constructor(address treasury, address nft) ERC20("North Coin", "NORTH") {
  _treasury = treasury;
  _nft = nft;
  _router = 0xBBe737384C2A26B15E23a181BDfBd9Ec49E00248;
  IUniswapV2Router02 router = IUniswapV2Router02(_router);
  _weth = router.WETH();
  _pair = IUniswapV2Factory(router.factory()).createPair(address(this), _weth);
  _mint(treasury, 10 ** decimals() * MAX_SUPPLY);
  _updateHolders(treasury);
}
```

RECOMMENDATIONS FOR

GOOD PRACTICES

1. Consider fundamental tradeoffs
2. Be attentive to blockchain properties
3. Ensure careful rollouts
4. Keep contracts simple
5. Stay up to date and track development

North Apes

GOOD PRACTICES FOUND

- ✔ The owner cannot mint new tokens after deployment
- ✔ The owner cannot set a transaction limit
- ✔ The smart contract utilizes "Math" to prevent overflows

SPYWOLF

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Disclaimer

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No applications were reviewed for security. No product code has been reviewed.